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(71) Applicant(s)
NEC Corporation

(Incorporated in Japan)

7-1 Shiba 5-chome, Minato-ku, Tokyo 108-01, Japan

(72) Inventor(s)
Takeshi Ishida
Noriko Norimatsu

(74) Agent and/or Address for Service
Reddie & Grose
16 Theobalds Road, London, WC1X 8PL,
United Kingdom

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H4K KFH KYX

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GB 2251764 A GB 2158677 A US 4899358 A
US 4894861 A

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KY4M12
INT CL[5] H04M , H04Q

(54) Telephone with caller identifying and call screening functions.

(57) A telephone with caller identifying function receives call information including the call originator's telephone number, eg. from a radio device 4, and a CPU 3 analyzes the call information, extracts and reads the telephone number 12, and collates it 11 with designated telephone numbers stored in a memory 2. If the call originator's telephone number matches a stored designated telephone number, the CPU retrieves personal information corresponding to the stored designated telephone number, generates a voice signal by voice synthesizing means 13 and announces the call by a speaker 5. If there is no match between the call originator's telephone number and the stored designated telephone numbers, selection is made 15 as to whether the call is to be rejected. If it is not rejected, selection is made 16 as to whether a ringing tone is to be generated 14 and applied to the speaker, or a light 18 on the keypad is to be caused to flash 17 or a call answering device is to be caused to respond (19,20; Fig.8).

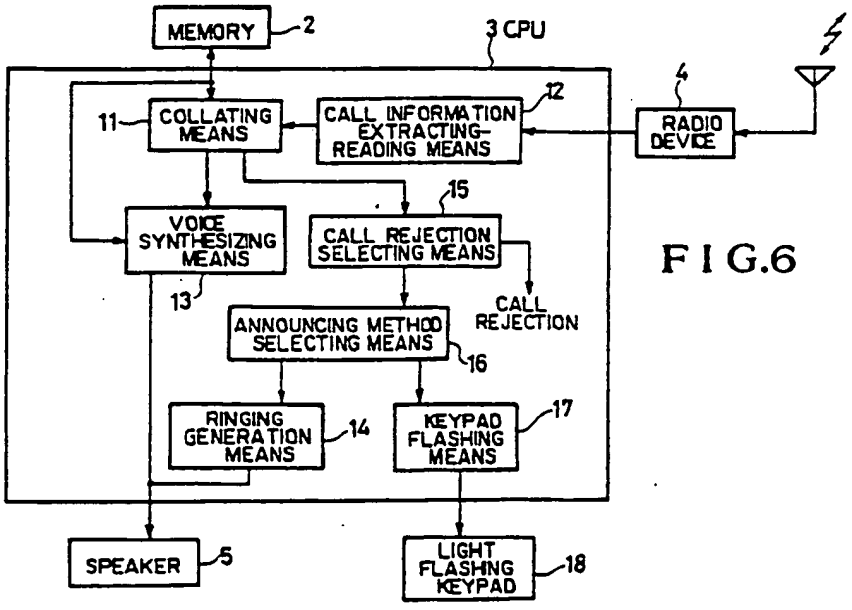

FIG.6

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FIG. 1 (PRIOR ART)

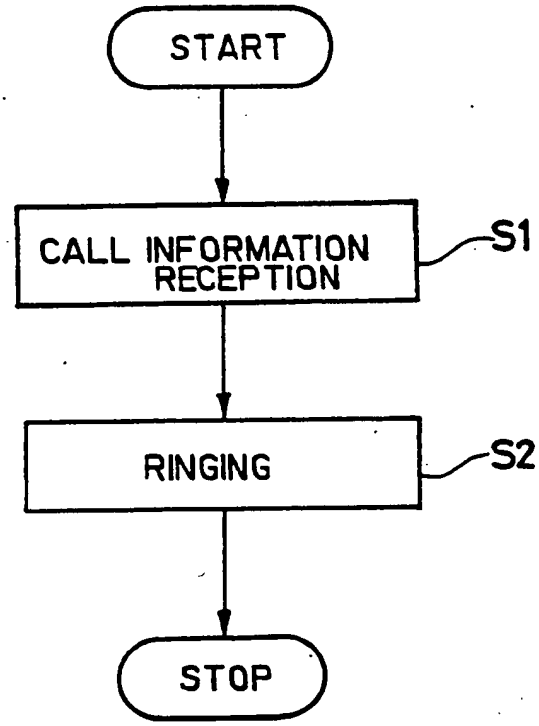


FIG.2

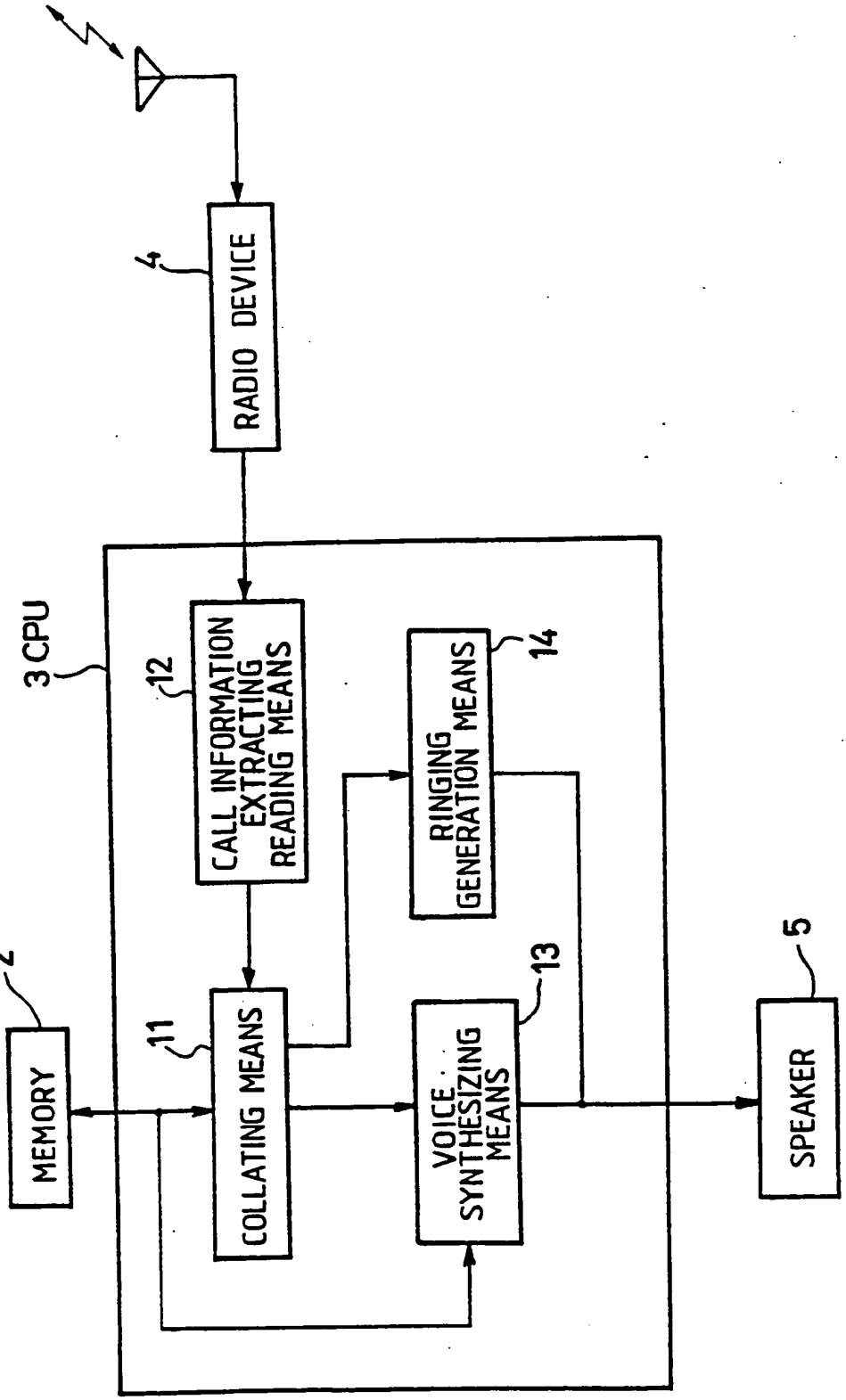

RADIO DEVICE
4
3 CPU
CALL INFORMATION EXTRACTING READING MEANS
12
RINGING GENERATION MEANS
14
MEMORY
2
COLLATING MEANS
11
VOICE SYNTHESIZING MEANS
13
SPEAKER
5

FIG.3

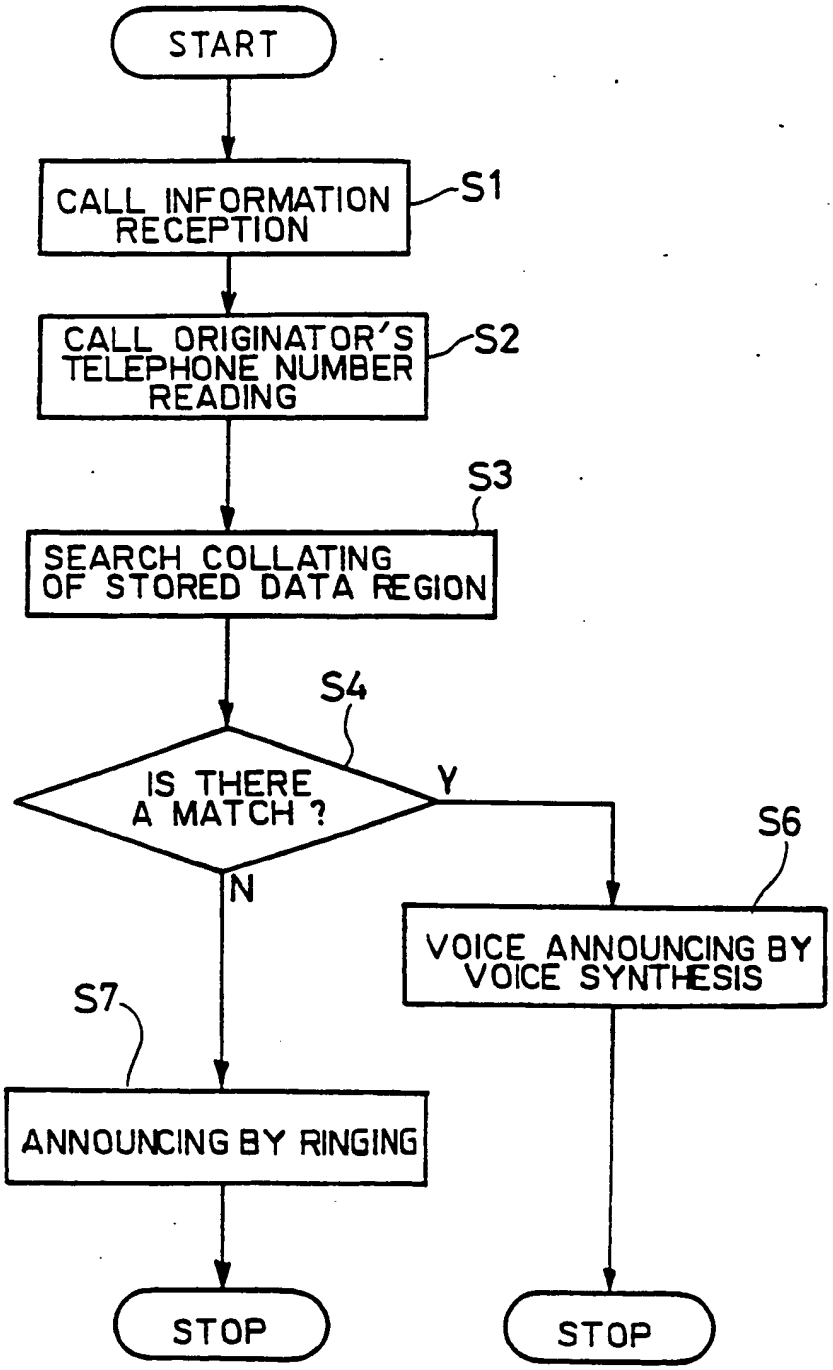

START
CALL INFORMATION RECEPTION
S1
CALL ORIGINATOR'S TELEPHONE NUMBER READING
S2
S3
SEARCH COLLATING OF STORED DATA REGION
S4
IS THERE A MATCH ?
Y
N
S6
VOICE ANNOUNCING BY VOICE SYNTHESIS
S7
ANNOUNCING BY RINGING
STOP
STOP

FIG.4

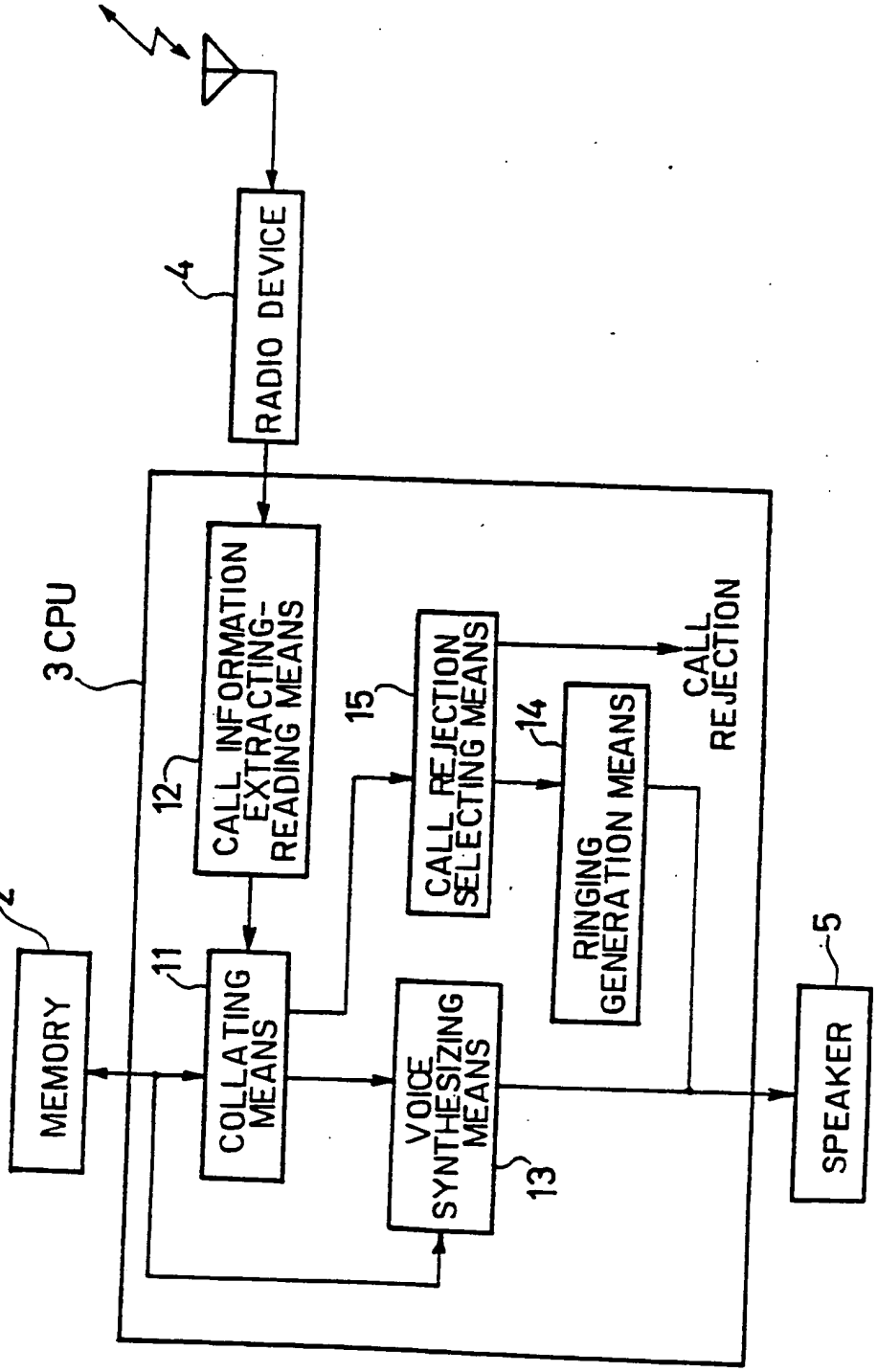
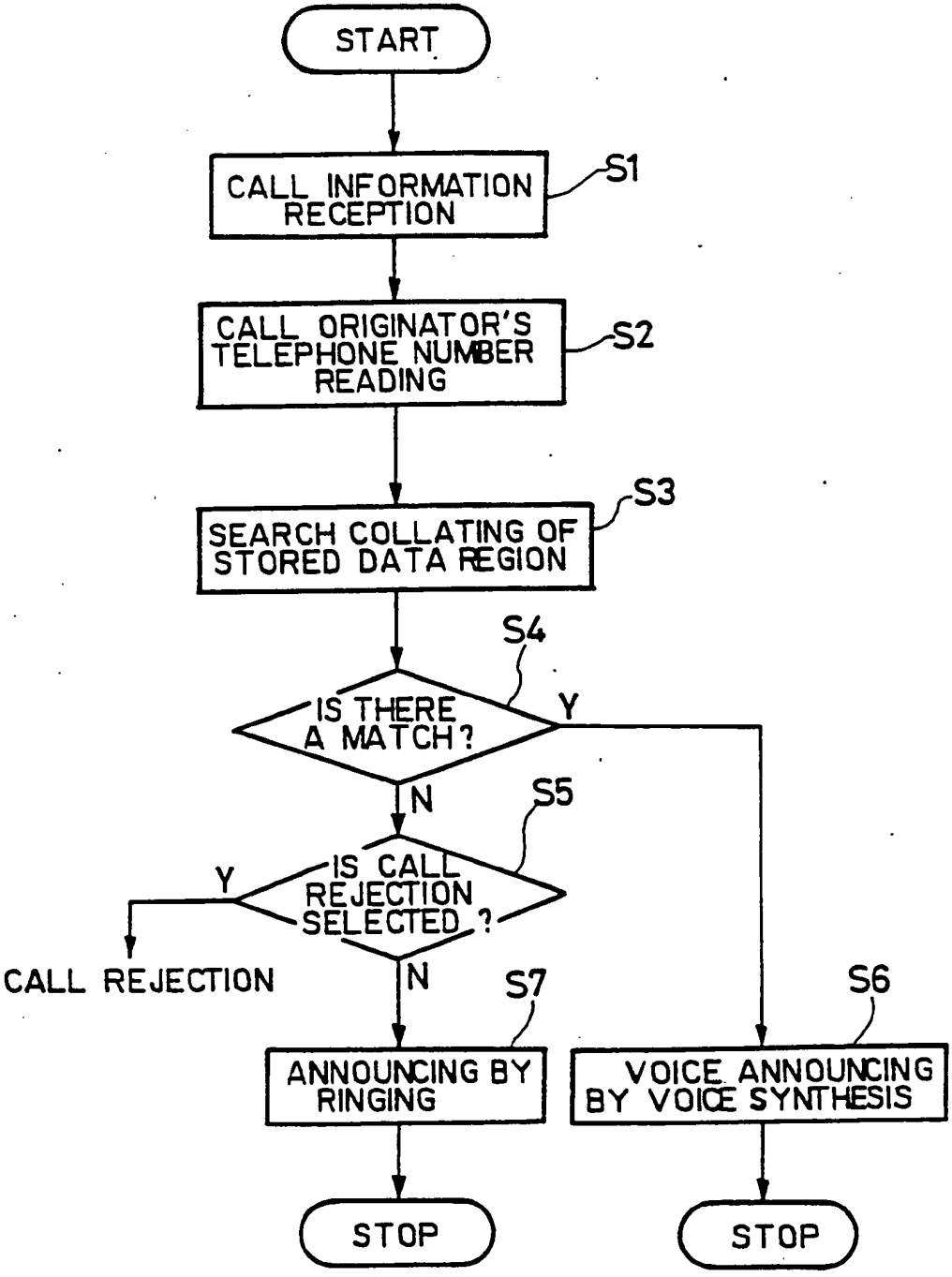

RADIO DEVICE
4
3 CPU
CALL INFORMATION EXTRACTING-READING MEANS
12
CALL REJECTION SELECTING MEANS
15
CALL REJECTION
RINGING GENERATION MEANS
14
MEMORY
2
COLLATING MEANS
11
VOICE SYNTHESIZING MEANS
13
SPEAKER
5

FIG.5


START
CALL INFORMATION RECEPTION
S1
CALL ORIGINATOR'S TELEPHONE NUMBER READING
S2
SEARCH COLLATING OF STORED DATA REGION
S3
S4
IS THERE A MATCH?
Y
N
S5
IS CALL REJECTION SELECTED?
Y
CALL REJECTION
N
S7
S6
ANNOUNCING BY RINGING
VOICE ANNOUNCING BY VOICE SYNTHESIS
STOP
STOP

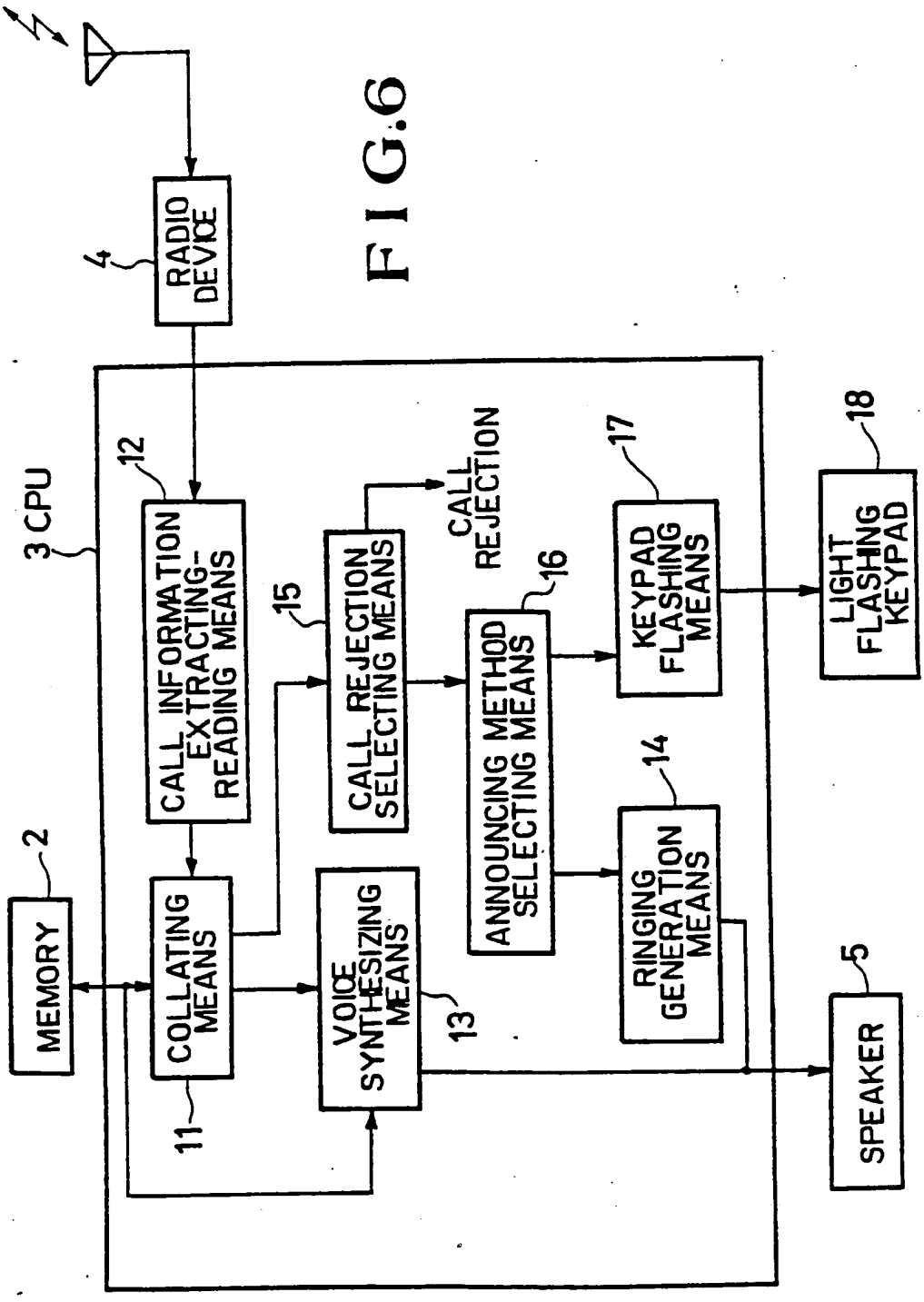
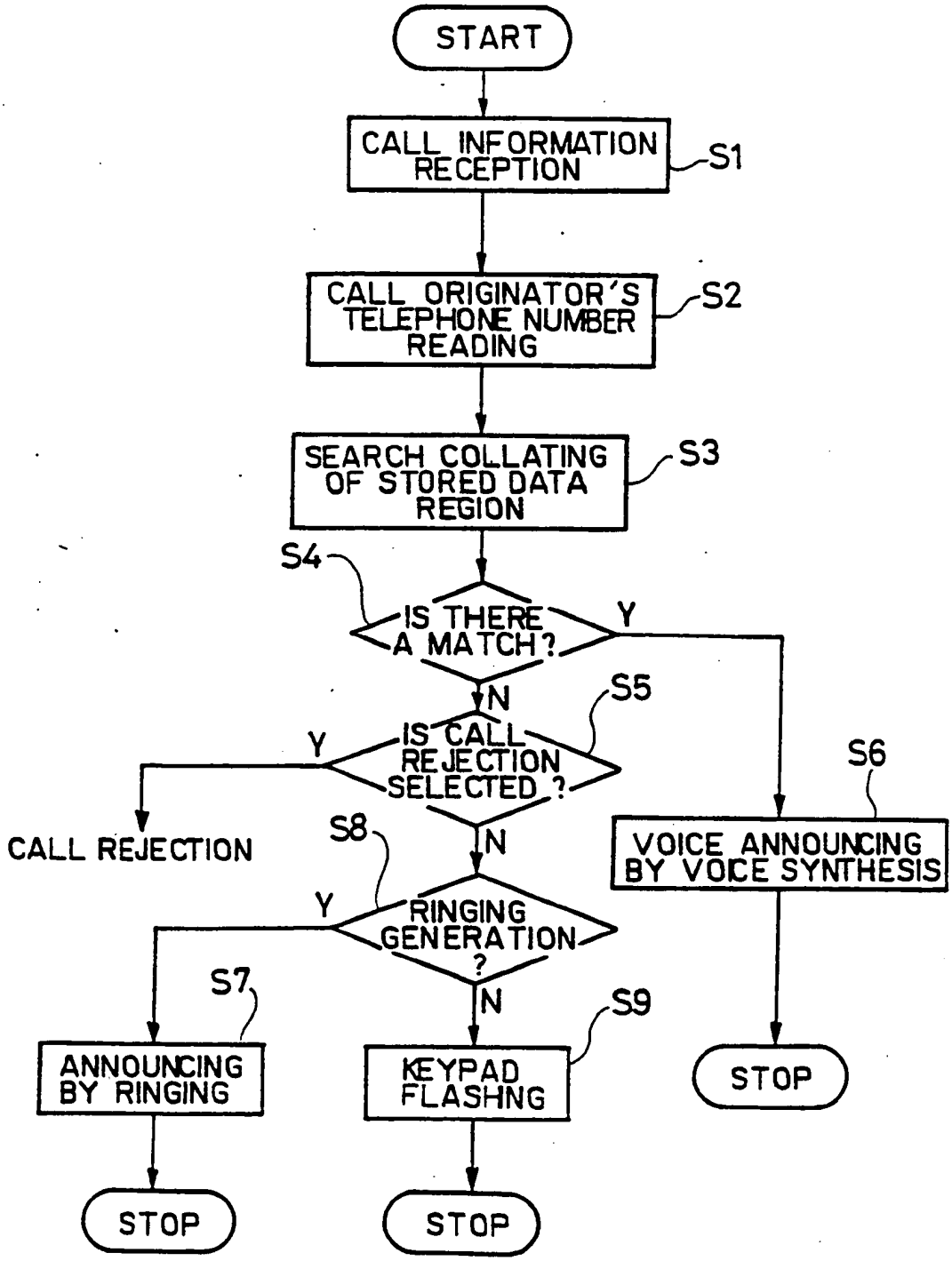

RADIO DEVICE
4
3 CPU
CALL INFORMATION EXTRACTING-READING MEANS
12
CALL REJECTION SELECTING MEANS
15
CALL REJECTION
ANNOUNCING METHOD SELECTING MEANS
16
KEYPAD FLASHING MEANS
17
LIGHT FLASHING KEYPAD
18
MEMORY
2
COLLATING MEANS
11
VOICE SYNTHESIZING MEANS
13
RINGING GENERATION MEANS
14
SPEAKER
5

FIG.6

FIG.7


START
CALL INFORMATION RECEPTION
S1
CALL ORIGINATOR'S TELEPHONE NUMBER READING
S2
SEARCH COLLATING OF STORED DATA REGION
S3
S4
IS THERE A MATCH?
Y
N
S5
IS CALL REJECTION SELECTED?
Y
N
CALL REJECTION
S6
VOICE ANNOUNCING BY VOICE SYNTHESIS
S8
RINGING GENERATION?
Y
N
S7
S9
ANNOUNCING BY RINGING
KEYPAD FLASHNG
STOP
STOP
STOP

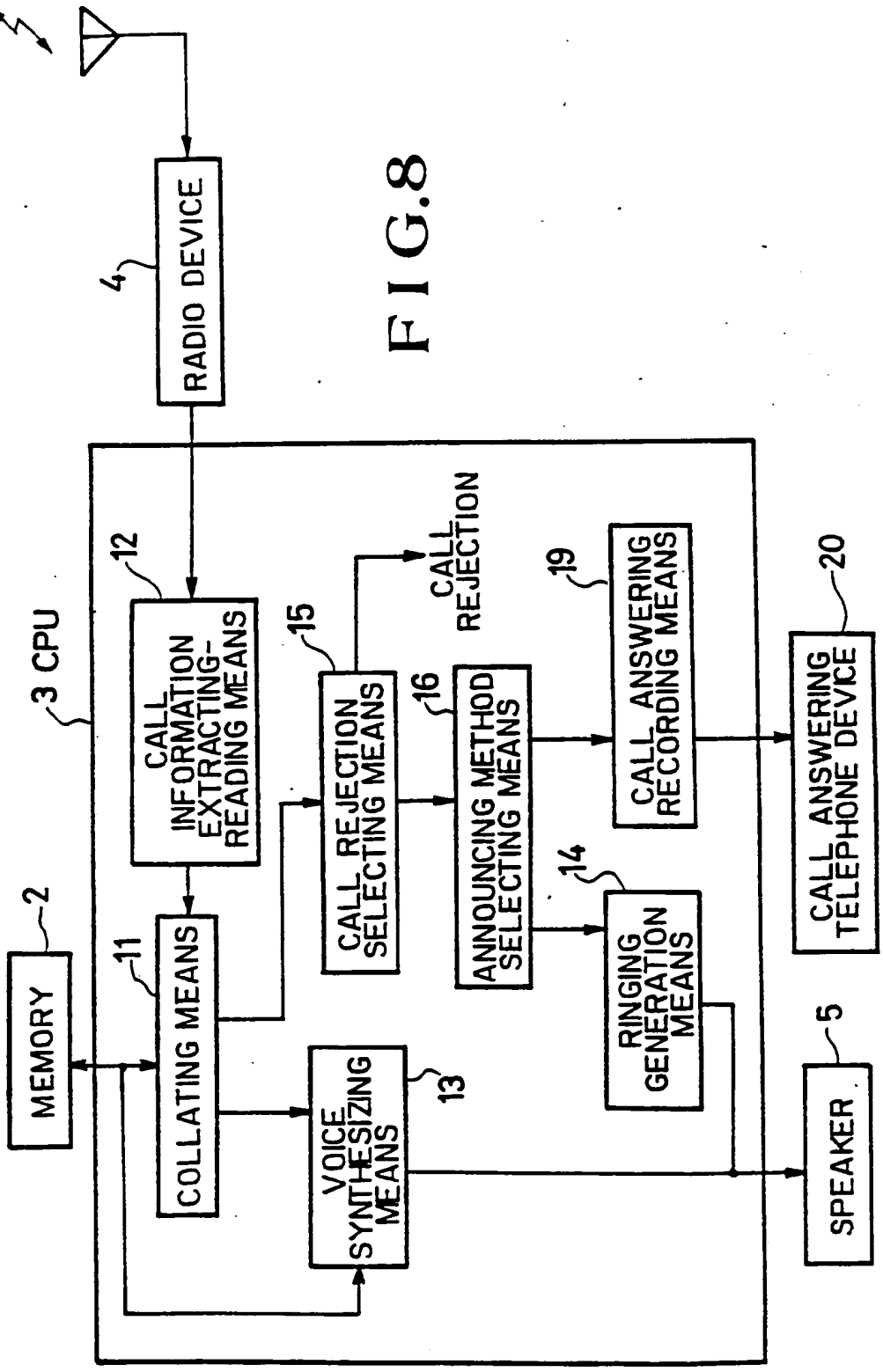
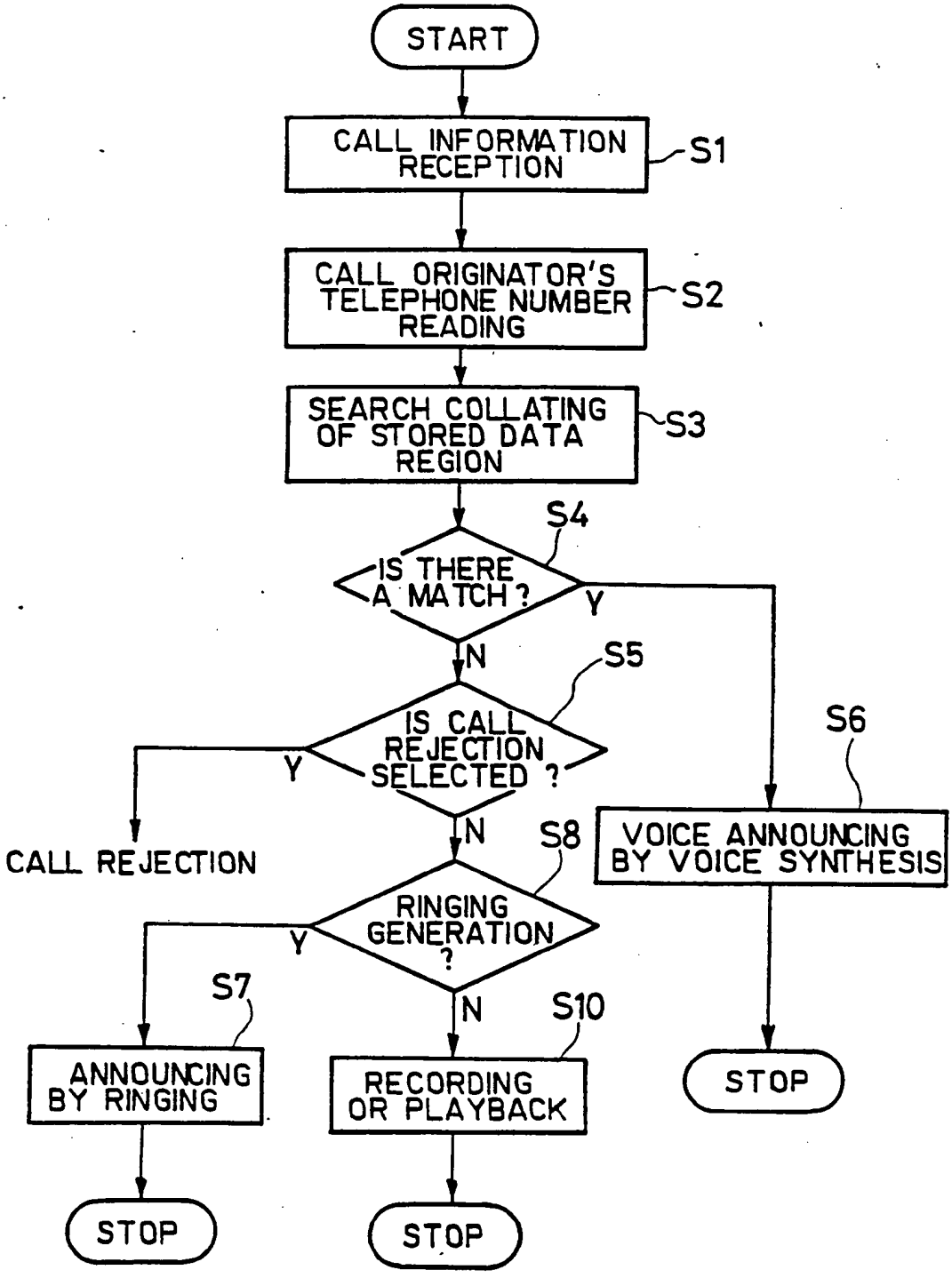

RADIO DEVICE
4
3 CPU
MEMORY
2
COLLATING MEANS
11
CALL INFORMATION EXTRACTING-READING MEANS
12
VOICE SYNTHESIZING MEANS
13
CALL REJECTION SELECTING MEANS
15
CALL REJECTION
ANNOUNCING METHOD SELECTING MEANS
16
RINGING GENERATION MEANS
14
CALL ANSWERING RECORDING MEANS
19
CALL ANSWERING TELEPHONE DEVICE
20
SPEAKER
5

FIG.8

FIG.9


START
CALL INFORMATION RECEPTION
S1
CALL ORIGINATOR'S TELEPHONE NUMBER READING
S2
SEARCH COLLATING OF STORED DATA REGION
S3
S4
IS THERE A MATCH ?
Y
N
S5
IS CALL REJECTION SELECTED ?
Y
CALL REJECTION
N
S6
VOICE ANNOUNCING BY VOICE SYNTHESIS
S8
RINGING GENERATION ?
Y
S7
ANNOUNCING BY RINGING
N
S10
RECORDING OR PLAYBACK
STOP
STOP
STOP

TELEPHONE WITH CALLER IDENTIFYING FUNCTION

The present invention relates to a telephone, and more particularly to a telephone with a caller identifying function.

Fig. 1 is a flow chart illustrating the manner of receiving a call by a conventional telephone. When the call information is received (Step S1) the bell is rung to alert the called person of the call (Step S2). In this case, even if the telephone receives call information including the telephone number of the call originator, the telephone merely announces the call with the usual ringing without identifying the call originator. In this way, with a conventional telephone, there was no way of clearly identifying the person originating the call when a call is received, and the called person is unable to learn the caller's identity until responding to the call, entering into conversation and hearing the caller's voice. As a result, there is the problem that it is necessary to respond to calls originating from callers with whom a conversation may not be desired.

The present invention is defined in the independent claims below, to which reference should now be made. Advantageous features of the invention are set forth in the appendant claims.

Various preferred embodiments of the invention are described in more detail below with reference to the drawings. Each of these embodiments comprises a caller identifying function which includes a receiving means for receiving call information including the telephone number of the outside call originator, storing means for storing data for both designated telephone numbers and personal information corresponding to those telephone numbers, call announcement generating means that converts the data content and ringing signal to an

announcing sound and outputs it to the outside, and a CPU that controls each of the receiving means, storing means and call announcement generating means and processes the call information of a received call. The CPU includes call information extracting and reading means for extracting and reading the call originator's telephone number from the call information inputted by the receiving means, collating means for collating the designated telephone numbers and the call originator's telephone number, voice sythesizing means for synthesizing a voice based on personal information that corresponds to a matched designated telephone number when the collation means finds a match, and ringing generating means for generating a ringing signal when the collating means does not discover a match.

Thus, the telephone allows a choice of multiple responses to caller information. As discussed below, these responses may in particular include various ways of responding to incoming calls from a call originator whose number has not been stored, e.g. by rejecting the call, by giving a special audible alarm, by flashing a light on the instrument, or by activating an answering device. When a call is received from an originator whose number is stored, the call is accepted and an audible alarm given. The personal information is then announced by the audible alarm, or could be visually displayed. The stored personal information can be inputted by the user of the telephone.

In one embodiment, the CPU additionally has a call rejection selecting means which, when no match is discovered by the collating means, enables choosing between having the telephone not sound any announcement of a call as a means of call rejection, or having the ringing generation means generate a ringing signal.

In another embodiment, the telephone has a flashing light keypad and keypad flashing means by which the CPU causes this keypad to flash, call rejection selecting means which, when no match is discovered by the collating means, enables choosing between having the telephone not sound any announcement of a call as a means of call rejection or allowing the call to be accepted, and announcing method selecting means which, when the call rejection selecting means is set to accept a call, enables choosing activation of either the ringing generation means or the keypad flashing means.

In yet another embodiment, the telephone is provided with a call answering device and the CPU is further provided with call answering means that activates the call answering device, call rejection selecting means which, when no match is discovered by the collating means, enables choosing between having the telephone not sound any announcement of a call as a means of call rejection or allowing the call to be accepted, and announcing method selecting means which, when the call rejection selecting means is set to accept a call, enables choosing activation of either the ringing generation means or the call answering means.

The invention will now be described in more detail, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 is a flow chart illustrating the call receiving procedure of a conventional telephone;

Fig. 2 is a block diagram showing an embodiment of the telephone with a caller identifying function of the present invention;

Fig. 3 is a flow chart showing the call receiving procedure of the embodiment of Fig. 2;

Fig. 4 is a block diagram of another embodiment of

the present invention;

Fig. 5 is a flow chart showing the call receiving procedure of the embodiment of Fig. 4;

Fig. 6 is a block diagram showing yet another embodiment of the present invention;

Fig. 7 is a flow chart showing the call receiving procedure of the embodiment of Fig. 6;

Fig. 8 is a block diagram showing yet another embodiment of the present invention; and

Fig. 9 is a flow chart showing the call receiving procedure of the embodiment of Fig. 8.

The present invention will be described with reference to the accompanying figures.

Fig. 2 is block diagram showing the structure of a first embodiment of a telephone with a caller identifying function of the present invention.

The present embodiment comprises radio device 4 that inputs call information by way of a radio circuit, CPU 3 that processes the call information inputted from radio device 4, memory 2 for the purpose of storing information for telephone numbers and personal information corresponding to those telephone numbers, and speaker 5 that converts a voice signal or an ringing signal inputted from CPU 3 into a voice or a sound and

outputs it. CPU 3 is further composed of call information extracting-reading means 12, collating means 11, voice synthesizing means 13, and ringing generating means 14. Call information extracting-reading means 12 extracts and reads the telephone number of the call originator included within the call information inputted from radio device 4 when a call is received. Collating means 11 collates the contents of memory 2 with the telephone number obtained by means of extracting-reading means 12, and, when the telephone number matches a designated telephone number stored in memory 2, collating means 11 both outputs a match signal to voice synthesizing means 13 and takes the personal information corresponding to the telephone number in memory 2 and inputs it to voice synthesizing means 13, and when two telephone numbers do not match, it outputs a mismatch signal to ringing generating means 14. Voice synthesizing means 13, in response to the match signal from collating means 11, produces a synthesized voice signal on the basis of the personal information corresponding to the designated telephone number inputted from memory 2 and sends it to speaker 5. Ringing generating means 14, in response to the mismatch signal from collating means 11, generates a ringing signal and sends it to speaker 5.

The operation of the present embodiment will next

be explained with reference to Fig. 3.

First, radio device 4 receives the call information by way of the radio circuit (Step S1), and call information extracting-reading means 12 reads the telephone number of the call originator from the call information (Step S2). Collating means 11, using the telephone number of the call originator, searches for the designated telephone number stored in the memory 2 (Step S3). If a matching number is found (Step S4), collating means 11 sends a match signal to voice synthesizing means 13 and in addition, takes the personal information corresponding to the designated telephone number from memory 2 and inputs it to voice synthesizing means 13. In response to this match signal, voice synthesizing means 13 produces a synthesized voice signal based on the inputted personal information. This synthesized voice signal can, for example, be a voice signal pronouncing the name of the call originator. By means of this voice synthesizer signal, the synthesized voice is generated from speaker 5, thereby announcing the call (Step S6). If there is no match in Step S4, a mismatch signal is sent and ringing signal is generated by ringing generating means 14, and the speaker sounds, thereby announcing the call (Step S7).

By the above-described procedure of the present

embodiment, when a call is received from a call originator whose telephone number has been previously stored in memory 2, the caller's name or other personal information will by announced by the synthesized voice, allowing the identity of the caller to be ascertained. With the knowledge of the caller's identity, the call can be smoothly handled. If the call is announced by ringing, it can be understood that the caller is not a person for whom information has been stored in the memory, allowing the option of not responding to the call.

Fig. 4 is a block diagram illustrating another embodiment of the present invention. In this embodiment, call rejection selecting means 15 has been added to ringing generating means 14, while the other components are the same as in Fig. 2. Accordingly, the equivalent composing elements are identified by the same reference numerals as are used in Fig. 2.

Call rejection selecting means 15 is provided in a stage preceding the ringing generating means 14, and in a case in which collating means 11 finds no match in collating, has the function of allowing selection of either call rejection or ringing generation. This selection can be carried out beforehand by the call receiver.

Fig. 5 is a flow chart illustrating the call

receiving procedure of the present embodiment. It can be seen that only a Step 5 (S5) has been added to the flow chart of Fig. 2 and that all other components are the same. The operation of Step 5 (S5) will therefore be explained.

When the call originator's telephone number does not match a designated telephone number in memory 2 in Step S4, call rejection selecting means 15 rejects the call and does not cause ringing to be generated if call rejection has been set beforehand. If call rejection has not been set beforehand, ringing generating means 14 is caused to generate a ringing signal, thereby announcing the call (Step S7) by speaker 5.

With the telephone of the present embodiment, it is possible to reject calls from a caller whose telephone is not stored in the memory 2, and the telephone user need not be disturbed by undesired calls.

Fig. 6 is a block diagram of yet another embodiment of the telephone with a caller identifying function of the present invention. The telephone of the present embodiment, in addition to the composing elements of the embodiment of Fig. 4, is provided with announcing method selecting means 16, and keypad flashing means 17, and moreover, has a construction allowing flashing of keypad 18, but in all other respects has

the same construction as shown in Fig. 4. Accordingly, the equivalent composing elements are identified by the same reference numerals as used in Figs. 2 and 4.

Call rejection selecting means 15 is provided at a stage preceding announcing method selection means 16, and in a case in which collating means 11 finds no match in collating, has the function of allowing selection of either call rejection or call announcement. This selection can be carried out beforehand by the call receiver.

Announcing method selection means 16 is provided in a stage preceding ringing generating means 14 and keypad flashing means 17, and in a case in which collating means 11 finds no match in collating, and furthermore, when call rejection is not effected by call rejection selecting means 15, has the function of allowing selection of either ringing generation or keypad flashing. This selection can be carried out beforehand by the call receiver.

Fig. 7 is a flow chart showing the call receiving procedure of the present embodiment. This chart adds only Step S8 and Step S9 to the procedure of Fig. 5, and in all other respects is the same as Fig. 5. When the call originator's telephone number does not match with a designated telephone number in memory 2 in Step S4, call rejection selecting means 15 rejects the call

and does not cause ringing to be generated or the keypad to flash if call rejection has been set beforehand. If call rejection has not been set, and if ringing generation has been set beforehand, announcing method selecting means 16 causes the ringing signal to be generated, thereby announcing the call by speaker 5. If ringing generating has not been set beforehand, keypad 18 is caused to flash, thereby signaling the reception of a call (Step S9).

Fig. 8 is a block diagram illustrating yet another embodiment of the present invention. In the telephone of the present embodiment, keypad flashing means 18 within the composition of the embodiment of Fig. 6 has been replaced by call answering recording means 19, while in other respects, this embodiment has the same composition as Fig. 6. Accordingly, the same composing elements are identified by the same reference numerals as used in Figs. 2, 4, and 6.

In a case in which collating means 11 finds no match in collating, and furthermore, when the call rejection is not effected by call rejection selecting means 15, if the call answering recording means 19 has been selected at announcing method selecting means 16, the call answering recording function operates and recording or playback is carried out between the caller and call answering telephone device 20.

Fig. 9 is a flow chart showing the call receiving procedure of the present embodiment. As can be seen, Step S9 of Fig. 7 has been replaced by Step S10, while in other respects the charts are identical. If ringing generation in Step S8 has not been set beforehand, call answering recording means 19 activates call answering telephone device 20 to respond to the caller or to store the caller's name or business (Step S10).

Although certain preferred embodiments of the present invention have been shown and described in detail, it should be understood that various changes and modifications may be made therein without departing from the scope of the appended claims.

CLAIMS

1. A telephone with a caller identifying function, comprising:

receiving means for receiving incoming call information containing a call originator's telephone number;

memory means for storing designated telephone numbers and personal information corresponding to said designated telephone numbers;

call announcement generating means for converting the content of said information and a ringing signal to an announcing sound; and

a CPU for controlling said receiving means, said memory means, and said call announcement generating means and for processing said call information of a call, said CPU comprising:

call information extracting-reading means for extracting and reading a call originator's telephone number contained in call information inputted to said receiving means;

collating means for collating said call originator's telephone number with said designated telephone numbers;

voice synthesizing means for synthesizing a voice based on personal information that corresponds to a matched designated telephone number when said collating means finds a match; and

ringing generating means for generating said ringing signal when said collating means discovers no match.

2. A telephone with a caller identifying function according to claim 1, further comprising a call rejection selecting means that allows selection of either generating no announcement sound at all, or generating ringing signal by said ringing generating means, when said collating means discovers no match.

3. A telephone with a caller identifying function according to claim 1 or 2, wherein said telephone with a caller identifying function further includes a keypad with a flashing light, and said CPU further comprises:

keypad flashing means for causing said keypad to flash;

call rejection selecting means that allows selection of either generating no announcement sound at all for call rejection, or receiving the call, when said collating means discovers no match; and

announcing method selecting means that allows selection of activating either said ringing generating means or said keypad flashing means when said call rejection selecting means is set for receiving a call.

4. A telephone with a caller identifying function according to claim 1, 2 or 3, wherein said telephone with caller identifying function further includes a call answering telephone apparatus, and said CPU further comprises:

call answering recording means for activating said call answering telephone apparatus;

call rejection selecting means that allows selection of either generating no announcement sound at all for call rejection, or receiving the call, when said collating means discovers no match; and

announcing method selecting means that allows selection of activating either said ringing generating means or said call answering recording means when said call rejection selecting means is set for receiving a call.

5. A telephone with a caller identification function, comprising receiving means for receiving incoming call information containing a call originator's telephone number, memory means for storing designated telephone numbers and for storing respective personal information associated with the stored telephone numbers, and means for comparing the call originator's telephone number received by the receiving means with the stored telephone numbers and, if the call originator's telephone number matches any of the stored telephone numbers, providing an output signal representative of the associated stored personal information.

6. A telephone with a caller identification function, comprising receiving means for receiving incoming call information containing a call originator's telephone number, memory means for storing designated telephone numbers and for storing respective personal information associated with the stored telephone numbers, and means for comparing the call originator's telephone number received by the receiving means with the stored telephone numbers, and means responsive to the absence of a match and operable in two or more different modes, the active mode of operation being pre-selectable by the user of the telephone from amongst the said two or more different modes.

7. A telephone with a caller identification function, substantially as herein described with reference to and as shown in the drawings.

Patents Act 1977
Examiner's report to the Comptroller under Section 17 (The Search Report)

Application number
GB 9312643.1

Relevant Technical fields

(i) UK Cl (Edition L) H4K (KFH,KFB,KBHC,KBNX,KYX, KY4M12)

(ii) Int Cl (Edition 5) H04M, H04Q

Search Examiner
MR S J L REES

Databases (see over)
(i) UK Patent Office

(ii)

Date of Search
2 SEPTEMBER 1993

Documents considered relevant following a search in respect of claims ALL CLAIMS

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X,P	GB 2251764 A (TECHNOPHONE) whole document = EP 0498997 A2	5
Y	GB 2158677 A (ALDERMAN) lines 17-22 of page 1	3
X,Y	US 4899358 (A T & T) whole document especially lines 9-15 of page 2	X=1,2,4,5 6 Y=3
X	US 4894861 (KOKUSAI-KAISHA) whole document especially lines 18-54 of column 4	1,5

me - doc99\fil000753

Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).